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**Gametophytes and embryo of Cunninghamia.**—This monotypic Chino-Japanese genus has been investigated by MIYAKE, who has just published a preliminary notice<sup>19</sup> of his results. The male gametophyte has no prothallial cells, and at pollination it consists of two nuclei (generative and tube). These two nuclei enter the pollen tube, in which the generative nucleus soon divides, one of the daughter nuclei entering into the structure of the rapidly enlarging body cell, and the stalk nucleus remaining free in the cytoplasm of the tube. Pollination occurs early in April, and the tube reaches the archegonial complex about the end of June. There is a solitary megasporangium mother cell, which divides about the time of pollination. The embryo sac is invested by a distinct tapetal zone, and before the end of June is full of tissue. The archegonium initials appear early and the development of archegonia is rapid, the complex being fully formed by the end of June. This complex is singular in that the group of archegonia (15 in the case illustrated) surrounds a central mass of sterile tissue. The cutting-off of a ventral nucleus and its rapid disorganization were observed, this division being promptly followed by fertilization during the first week of July. The fusion nucleus soon divides, and the two daughter nuclei pass to the base of the egg. Walls appear after eight nuclei are formed, which is apparently true for Pinaceae without exception. The proembryo comprises three tiers of cell, with the usual functions.—J. M. C.

**The ancestor of *Pinus*.**—JEFFREY concludes that Prepinus, a name which he gives to an abietineous form from the Middle Cretaceous of Staten Island (N. Y.), is the direct ancestor of *Pinus*.<sup>20</sup> It is characterized by deciduous dwarf-shoots, which bore numerous spirally arranged leaves, and it is the structure of these leaves that forms the basis of the claim mentioned. They have paired resin canals continuous to the very base; possess a well-marked centripetal xylem; and about the vascular bundles there is a complicated double sheath of transfusion tissue closely related to the centripetal wood and resembling that found in some of the Cordaitales. It is also shown that many of the true pines of the Middle Cretaceous had the same double "transfusionary foliar sheath," but lacked the centripetal wood. The tissue on the ventral side of the protoxylem in existing coniferous leaves, which has been described by WORSDELL as representing centripetal xylem, JEFFREY regards as a relic of the inner transfusion sheath. In this way he has connected *Pinus* with the Cordaitales through Prepinus; and has shown that the Mesozoic pines display transition characters between Prepinus and the pines of today. His conclusion is that the Abietinae are the oldest tribe of Coniferales, and that *Pinus* is its oldest living representative.—J. M. C.

<sup>19</sup> MIYAKE, KIICHI, The development of gametophytes and embryogeny of Cunninghamia (Preliminary note). Bot. Mag. Tokyo 22:45-50. figs. 14. 1908.

<sup>20</sup> JEFFREY, EDWARD C., On the structure of the leaf in Cretaceous pines. Annals of Botany 22:207-220. pls. 13, 14. 1908.